WHAT IS CLAIMED IS:

1. Air conditioning system for motor vehicles which is fitted with an injection computer and with a refrigerant fluid circuit comprising a compressor, a cooling member, an expansion member and an evaporator, together with an electronic control device intended to interact with the refrigerant fluid circuit and the injection computer, and which comprises:
- a first measuring member suitable for supplying a value relating to the fluid pressure at a first point in the air conditioning circuit, termed the first pressure, said first point being situated between the outlet of the expansion member and the outlet of the evaporator,
- a second measuring member suitable for supplying a value relating to the fluid pressure at a second point in the air conditioning circuit, termed the second pressure, said second point being situated at the inlet to the compressor,
and wherein the electronic control device is able to make use of the solution of an equation which relates the mass flow rate of the refrigerant fluid to the difference in pressure between the first point and the second point in order to calculate an estimate of a magnitude relating to the refrigerant fluid.

2. Air conditioning system according to claim 1, wherein the magnitude relating to the refrigerant fluid is the mass flow rate f refrigerant fluid, and the electronic control device is able to solve the said equation from the value of the first pressure and the value of the second pressure.

3. Air conditioning system according to claim 1, wherein the magnitude relating to the refrigerant fluid is the second pressure and the electronic control device is able to solve the said equation from the value of the mass flow rate of the fluid and the value of the first pressure.

4. Air conditioning system according to claim 3, wherein the cooling member is a condenser and the system comprises measuring members suitable for supplying a value relating to the temperature of the flow of outside air at the inlet to the condenser and a value relating to the pressure of the fluid at the delivery of the compressor, termed the high pressure, the electronic control device being able to use the values supplied by said measuring members to make use of the solution of an equation which relates the mass flow rate of the refrigerant fluid to the temperature of the flow of outside air at the inlet to the condenser and to the high pressure in order to calculate an estimate of the instantaneous value of the mass flow rate of the refrigerant fluid.

5. Air conditioning system according to claim 1, wherein the compressor is of variable displacement and the magnitude relating to the refrigerant fluid is the minimum value of the pressure of the fluid corresponding to the maximum displacement of the compressor, the electronic control device being able to solve the said equation from the value of the first pressure and the value of the speed of rotation of the compressor.

6. Air conditioning system according to claim 3, wherein the value of the speed of rotation of the compressor is supplied to the electronic control device by the injection computer.

7. System according to claim 1, wherein the compressor is fitted with a control valve and the second measuring member is a sensor suitable for supplying the instantaneous value of the current to the control valve, the electronic control device being able to calculate an initial estimate of the second pressure from the value of the current to the control valve of the compressor which is supplied by the second measuring member.

8. Air conditioning system according to claim 7, wherein the compressor is of variable displacement and the magnitude relating to the refrigerant fluid is the minimum value of the pressure of the fluid corresponding to the maximum displacement of the compressor, the electronic control device being able to solve the said equation from the value of the first pressure and the value of the speed of rotation of the compressor, and wherein the electronic control device is able to compare the initial estimate of the second pressure with the minimum value of the second pressure.

9. Air conditioning system according to claim 8, wherein the electronic control device is able to react to the fact that the initial estimate of the second pressure is equal to or less than the minimum value of the

second pressure by supplying a final estimate of the second pressure which is substantially equal to the minimum value of the second pressure.

10. Air conditioning system according to claim 8, wherein the electronic control device is able to react to the fact that the second pressure is higher than the minimum value of the second pressure by supplying a final estimate of the second pressure which is substantially equal to the initial estimate of the second pressure.

11. Air conditioning system according to claim 1, wherein the second member is a sensor which is positioned at the second point and which is able to supply the instantaneous value of the second pressure.

12. Air conditioning system according claim 1, wherein the first measuring member is a sensor which is positioned at the first point and which is suitable for supplying the instantaneous value of the first pressure directly.

13. Air conditioning system according to claim 1, wherein the first measuring member is a temperature probe which is positioned in the fins of the evaporator and which is suitable for supplying a measurement of the instantaneous value of the temperature of the air in the evaporator.

14. Air conditioning system according to claim 1, wherein the first measuring member is a temperature probe which is positioned downstream of the evaporator and

which is suitable for supplying a measurement of the instantaneous value of the temperature of the air entering the evaporator.

15. Air conditioning system according to claim 1, wherein the first measuring member is a temperature probe which is suitable for supplying the instantaneous value of the temperature of the fluid, the probe being positioned at the first point, in contact with the liquid part of the fluid.

16. Air conditioning system according to claim 15, wherein the first point is situated at a location in the air conditioning circuit at which the refrigerant fluid is in a diphase state.

17. Air conditioning system according to claim 13 in which the expansion member is a thermostatic expander, wherein the temperature probe is positioned in the zone where fluid is injected into the evaporator.

18. Air conditioning system according to claim 13, wherein the electronic control device is able to estimate the value of the first pressure from the value supplied by the temperature probe.

19. Air conditioning system according claim 13, wherein the temperature probe has a time constant equal to or less then 5 seconds.